

GLOBAL INNOVATORS SERIES

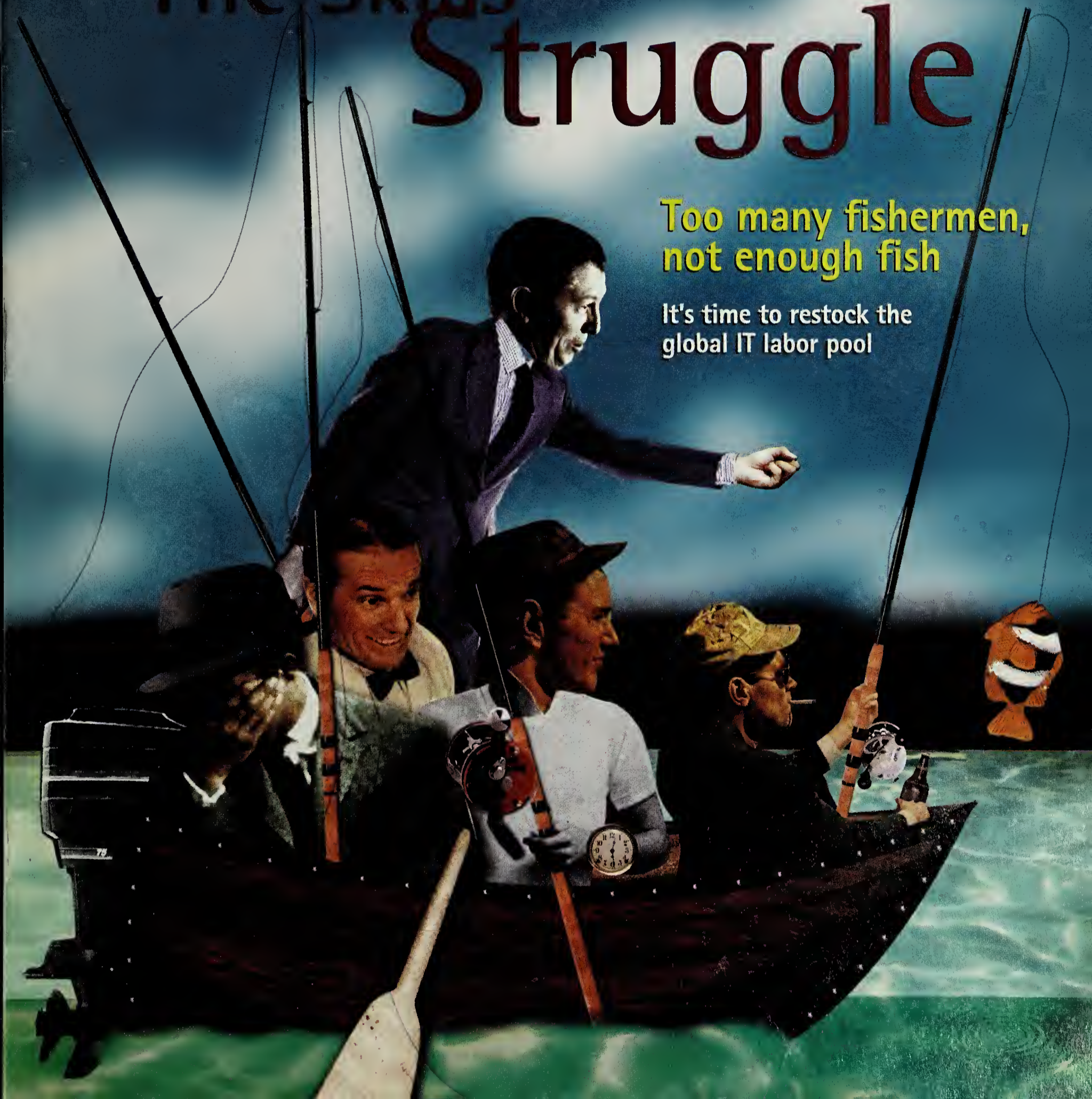
# COMPUTERWORLD

December 7, 1998

## The Skills Struggle

Too many fishermen,  
not enough fish

It's time to restock the  
global IT labor pool





e-business



# HOW TO KEEP A SECRET.

In transforming your business into an e-business, the single most important issue you have to wrestle with is the issue of security.

Without flexible control over who sees what information, all the benefits of putting your key business processes online (which is, after all, the definition of an e-business) are a moot point. And when you connect your critical systems to the Web to help you improve customer service or increase the efficiency of your organization – security is a white-knuckle issue for the people charged with keeping your systems running and your data protected.

It's not just a matter of whom you let in and whom you keep out (although that is obviously important). When you're using the Web (or an intranet) to do things like let your employees change the asset allocation of their 401(k) accounts or let your customers see what their credit balance is, you need the ability to determine who sees what and who can make changes to what they see.

IBM e-business solutions can help you manage access to the really important information you make available online. We've spent over three decades protecting the integrity of corporate information systems. We've pioneered things like Realtime Intrusion Detection, Anti Virus Labs, and Emergency Response Services. And we've made security an integral part of IBM e-business technology – so you can build Web sites that know how to keep a secret.

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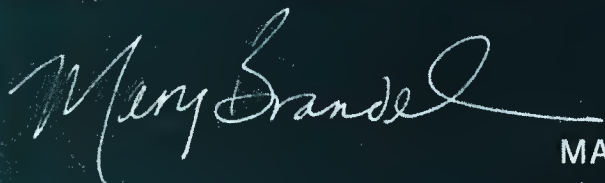
## Avoiding a Brain Drain

It's not a trait you'd choose to share with your peers around the globe. It's not a problem that can be solved quickly. But increasingly, companies around the world are having to face up to what is becoming an alarming issue: There aren't enough skilled people to build and run the IT systems that keep their businesses competitive.

Not everyone is experiencing a skills shortage. In certain countries, whole businesses are being formed around exporting talent to relieve a glut of programmers. And in the U.S., the extent of the shortage is hotly contested as domestic programmers feel pushed out of jobs by imported workers.

What's clear, however, is that companies need to invest — a lot — in training their own people and in working with universities to ensure the next generation of IT employees has the knowledge to build competitive systems. The alternative isn't pretty. Countries around the world report skyrocketing salaries and high turnover as IT workers become a scarce commodity. Market research houses such as International Data Corp. in the U.S. warn that entire regions could lose their competitive edge if they don't develop their skills base. Fortunately, a few forward-thinking companies and governments have started to do just that.

In some areas of the world, there's a long road ahead as entire institutions need to be restructured. But as we hit multiple crisis points such as the year 2000 and the euro conversion, it couldn't be more clear that now is the time to start building our skills and staffs for the future.



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## Two sides to the currency crisis in Asia

WHILE IT SPENDING  
IS SQUEEZED OR  
ELIMINATED, A SILVER  
LINING EXISTS FOR IT  
OUTSOURCERS

BY TERHO UIMONEN

Well into the second year of Asia's economic crisis, information technology budgets in that area of the world face a day of reckoning. Managers are asking a difficult question: Are information systems indispensable tools or cuttable cost centers?

Many Asian businesses are casting a critical eye on their IT capital expenditures — and in some cases deciding to cut them all together through outsourcing.

"The name of the game is to differentiate whether expenditure is essential or not," says James Tang, group MIS director at Hong Kong-based Astec (BSR) PLC, one of the world's leading suppliers of electronic power conversion products, with sales of \$632 million last year.

In July last year, a sharp devaluation in the Thai baht sparked a domino effect that spread quickly throughout Southeast Asia and then headed north, infecting the re-

gion's hoped-for savior, Japan. Only a select few Asian countries, such as China, India and Taiwan, are likely to post economic growth this year.

With little respite in sight, Asian businesses are forced to refocus on their core competencies, and in many cases, IT isn't making the cut. Growing numbers of regional airlines, banks and manufacturers are shedding their IT burden by signing multiyear outsourcing contracts.

"IT services is a phoenix rising from the ashes," says Craig Baty, principal analyst for IT services in the Asia-Pacific region at Gartner Group Inc.'s Dataquest unit in Sydney, Australia. "The crisis will probably prove to be one of the best things that ever happened to IT service providers in Asia."

Dataquest predicts that the market for professional IT services in the Asia-Pacific region outside Japan will reach \$46.6 billion by 2002, as compared with nearly \$16 billion last year. That's a compound annual growth rate of 24%. But not everybody is jumping on the bandwagon. "Outsourcing doesn't make sense all the time," says Vincent Wong, IT manager for the Greater China and Korea region at Monsanto Far East Ltd., a manufacturer

# view

TRENDS, ISSUES AND IDEAS FROM AROUND THE GLOBE



LARRY GOODE

of agricultural products, pharmaceuticals and food ingredients. "In Asia, it's not [always] appropriate, [because there are] not so many very capable outsourcing vendors."

However, it's becoming an attractive solution, particularly for some of the region's battered airlines. Badly hurt by the downturn in inter-Asian travel, which prior to the crisis was their most lucrative business, regional airlines are scrambling to cut costs. "We are not experts in technology, but we are experts in providing a first-class airline service," says Y. H. Cho, president of Korean Air, in a September statement announcing that the Seoul-based airline had

signed a 10-year outsourcing contract with IBM Global Services valued at more than \$400 million.

Hong Kong's Cathay Pacific Airways Ltd. also is expanding its outsourcing ties with IBM. But officials were quick to point out that the deal wasn't a direct result of the Asian crisis. "The main driver is that we want to improve the level of service to our internal department," says David Ho, manager of IT infrastructure distribution at Cathay.

The outsourcing trend also is beginning to make inroads in financial institutions and manufacturing. In Japan, both Daiwa Bank and soap maker Kao Corp. have outsourced

IT services to IBM Global Services.

"It's literally across the board," says Alfred Amoroso, the Tokyo-based general manager of global services at IBM Asia-Pacific Service Corp. "Staying competitive at an affordable cost is a major challenge companies here have."

As regional governments, including Australia, Singapore and Taiwan, get ready to outsource most of their IT operations, analysts expect the trend to escalate. "Once government commits to outsourcing, then the private sector follows," Baty says.

## NOT A PRETTY PICTURE

With thousands of businesses suddenly bankrupt and millions out of work, it is hardly surprising that spending has declined for nearly all IT product segments.

Total IT spending this year in the Asia-Pacific region (outside Japan) is expected to contract 14.3% from last year to \$41.2 billion, according to International Data Corp. (IDC), a market researcher in the U.S. and sister company to *Computerworld*.

In this year's second quarter, the negative trend finally caught up with the networking market. LAN market revenue in the Asia-Pacific region (outside Japan) posted a 12.6% year-on-year decline, down from \$561.6 million in the same period last year, according to IDC. The spending

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A look at the skills shortage in Europe, Asia, the U.S. and Latin America.



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drop would have been more significant had it not been for some of the region's more far-sighted governments, which continue to invest in their network infrastructures, says Sandra Ng, manager of networking products research at IDC Asia-Pacific.

Even government spending, however, has slowed. Malaysia has delayed parts of its much-ballyhooed Multimedia Super Corridor project, and Singapore has also quietly scaled back its aggressive IT infrastructure plans by lengthening the implementation time for some network projects, Ng says. "The value stays the same, but they stretch the time from three to nine months,"

she says.

When it comes to prioritizing IT projects, the year 2000 problem is one of the most time-critical issues companies in Asia must grapple with.

Analysts say Asia is behind the developed world in year 2000 readiness, and although funding has started to increase, more needs to be done. "We expect a much larger proportion of corporate IT funding in Asia to be dedicated to Y2K in 1999 — a move that will further delay purchases of hardware products in particular," Philbin says.

Asian governments, meanwhile, are using a mix of carrot-and-stick incentives to ensure that firms adequately deal with year 2000. In Taiwan, for

example, the government has added year 2000-compliance spending to the list of tax-deductible expenses.

China has set a March 1999 deadline for readying the country's 10 million systems for the year 2000 with final testing to be completed by September 1999, says Zhang Qi, director general of the department of electronics and IT products at China's Ministry of Information Industry.

Admitting that China lags behind the developed world by nine to 12 months in year 2000 readiness, Zhang nevertheless expressed confidence that the goals will be met. The government is also training 5,000 engineers to help organizations complete their year

2000 projects, she adds.

Faced with the grim reality of shrinking markets and budget cuts, Asian IT industry officials remain cautiously optimistic, hoping for a light at the end of the tunnel.

In a speech at the opening of the Comdex Asia trade show in September, Singapore Federation of Computer Industries Chairman William Lu tried to cheer up a crowd of regional IT vendor representatives. "While we cannot say we have reached the bottom of the cycle, it is certain that companies [that survive] will come out of this fitter and wiser than before," he says. □

*Uimonen writes for the IDG News Service in Taipei.*

## INTERNET STAYS HOT AMID ASIAN CRISIS

By Terho Uimonen

If there's one technology surviving Asian budget cuts, it's the Internet.

By 2000, Web spending will account for 20% of the average corporate information technology budget, according to Dennis Philbin, vice president and managing director at IDC's Asia-Pacific unit.

In that same time frame, the number of Internet users in the Asia-Pacific region outside Japan will grow from more than 8 million to more than 34 million, according to IDC.

Even in Indonesia — Ground Zero in the crisis-stricken region of Southeast Asia — the Web is offering at least some relief for one Web-savvy company.

As the country's sole agent for Toyota cars since 1969, PT Astra International Tbk. saw many of its car showrooms literally burn down during the street riots that led to the ouster of President Suharto earlier this year.

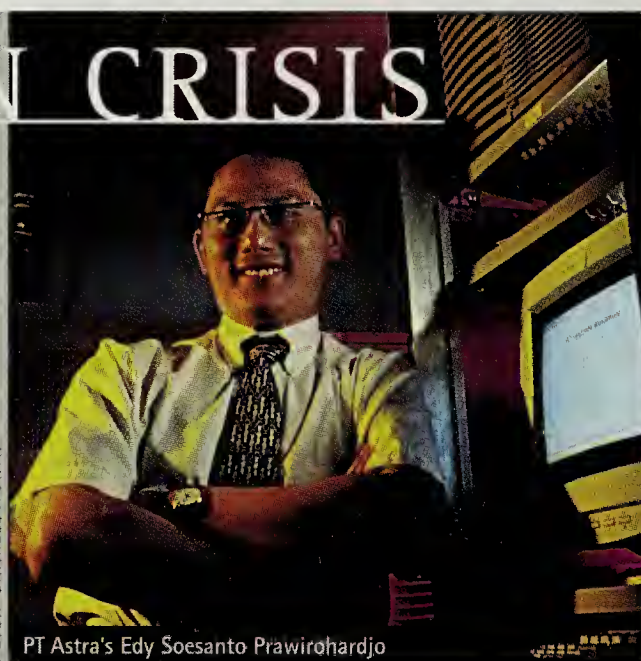
Hit hard by the rapid decline of the Indonesian rupiah, PT Astra viewed a Web-based application as the next-best option for showcasing Toyota in Indonesia. "In this situation, Web

kiosks are a more suitable media than having a car showroom," says Edy Soesanto Prawirohardjo, senior manager of corporate IT at PT Astra.

The result was an in-house-developed application for the Auto 2000 Information Kiosks that PT Astra plans to use as promotion and sales tools.

The application aims to give prospective buyers an interactive multimedia presentation of the available Toyota models.

With a front end based on Computer Associates International Inc.'s Jasmine



object database, the application is tightly integrated with the company's SAP AG R/3 environment, which among other mission-critical tasks, manages PT Astra's inventory management system.

The tie-in with the ERP software allows staff to check on stock availability, as well as financial information.

However, PT Astra — a vast conglomerate with 90,000 employees — may not be representative of most Indonesian businesses, Philbin notes.

"Even by world standards, PT Astra is very advanced when it comes to Internet and intranet applications," Philbin says.

# Oh, what a tangled web

Latin America IS BOOMING WITH IT SKILLS AND A READINESS TO APPLY TECHNOLOGY TO BUSINESS. BUT LONG-EXISTING PROBLEMS IN SOME REGIONS CAN MIRE IT PROJECTS

BY JEFFERY ZBAR

When Andre Vanyi-Robin launched Benevisual, a Caracas, Venezuela, division of his Miami-based Web site creation company, he couldn't have known that something as basic as the phone system would ultimately price him out of business.

In January 1996, Vanyi-Robin was paying \$60 per month for an Internet connection for his 15 employees — slightly more than the cost of his Miami office connection. But he was also doling out 30 cents per minute to the telephone company every time he logged on. The total: more than \$1,500 per month.

"The per-minute calls were more expensive in some cases than the long-distance phone calls," he says. What's worse, local laws forbid using voice lines for dedicated data service, and a 256K bit/sec. frame-relay network would have run \$3,000 per month, which priced his company right out of the market.

And Vanyi-Robin isn't alone. In Latin America, more than 70% of businesses are forced to pay high phone rates because they use dial-up connections — all as a way to avoid the even larger cost of a dedicated network.

Thwarted, Vanyi-Robin in January folded his Caracas operation into the Miami offices of Visualcom Inc., his Web site

development company targeting Latin American divisions of Fortune 500 companies.

Corporations looking to expand into Latin America often experience both a blessing and a curse. The region's information technology market is blossoming with skilled talent, plentiful equipment and a growing awareness of IT's importance in emerging economies. But long-existing problems, such as an aging telecommunications infrastructure run by inflexible government or private monopolies; high per-minute phone charges, even for local calls; and corruption in utilities and the government, continue to dog the region.

Differences vary so widely among countries that a company's strategy needs to be country-specific, says Kenneth Richard, president of Latinrep Associates Inc., an Oakland, Calif., sales and marketing outsourcing firm that targets the Latin American IT industry.

Chile, whose government helps guide IT development, has an entirely digital phone system, making quality connections easy and inexpensive, Richard says. Other governments, such as those in Argentina, Uruguay and Peru, are less involved in guiding business and industry.

With more than \$1 billion invested in the Argentine phone system in recent years,



connections are effective and timely, with setups taking just days or weeks. Also in that country, recent advances have been made in Internet affordability. Until recently, high per-minute costs have rendered Internet use off-limits to all but the upper class. But the local telephone duopoly has agreed to halve the cost of calls made to Internet service providers, according to Fernando Espuelas, CEO of StarMedia Network, a Spanish-language Internet content provider for Latin America.

In Mexico and Brazil, on the other hand, business and industry are emerging from years of protectionist policies that guaranteed jobs at good wages.

Thus, corruption exists, and

civil servants are apt to "intervene in productive sectors' daily lives," Richard says. Brazil is "by far the most complicated, frustrating and difficult" place to do business as its industries adapt to privatization, Richard says.

For example, it can take months to get a high-speed data line in Brazil — if you contact the right people. "Your biggest issue will not be if you can get a good solid T1 line," Richard says. "You can, but it may take you a year unless you're willing to pay many thousands of dollars to fix it."

From an IT view, the region is well-served by a fast-learning employee base, Richard says. Low labor costs diminish the cost of installation and

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## NOTES FROM AROUND THE GLOBE

LIVING UP  
TO THE THREE W'S

■ By 2002, there will be more "world" in the World Wide Web, according to U.S.-based consultancy Gartner Group Inc. In Japan, Internet access devices will increase from 10.8 million this year to 33.4 million in 2002. In Europe, they will grow from 21 million this year to 68.6 million in five years. But the real explosion will occur in the Asia-Pacific region, where 9.8 million devices this year will grow to 45.5 million in 2002.

MILLENNIUM  
AROUND THE WORLD

■ In Japan, 81% of companies are working on the millennium problem, according to the Tokyo Stock Exchange. A total of 9% are finished, and 6% said they had done nothing or saw no need to act.

■ In the overall Asia-Pacific region, the currency crisis has pushed spending into next year, at which time 5.2% of IT spending will be devoted to the year 2000 issue, according to International Data Corp., a U.S.-based market researcher and a sister company to Computerworld.

■ And in Russia, China, India, Argentina and Venezuela, two-thirds of the companies are expected to have a mission-critical system failure in 2000, according to Gartner Group. This summer, the research firm found that 23% of companies worldwide have yet to start dealing with year 2000 issues. Last year,

the percentage was 50%. (As reported by Computerworld.)

LATIN AMERICA,  
UNTAPPED

■ The Internet market in Latin America will soon be ripe for the picking, according to experts there. Growing competition in telecommunications markets, a rising middle class, favorable demographics and the availability of cheap PCs make it a region not to be taken lightly, they say. About 10 million of the region's approximately 500 million inhabitants surf the Internet today, up from 1 million two years ago, according to advertising agency Saatchi & Saatchi. By 2000, that figure is expected to more than triple. (As reported by IDG News Service, a sister company to Computerworld.)

EUROPEANS  
HESITANT ON WEB

■ European executives may voice enthusiasm for electronic business, but they're sideline players when it comes to the actual game, according to a study of European senior executives by Andersen Consulting. Though 82% believe electronic commerce will impact their businesses, only 39% are taking steps to incorporate it into their operations and strategies. Only 19% see it as a serious competitive threat. Reasons cited: a lack of consumer understanding; privacy, security and the lack of a framework for commercial regulation; and the need for governments to work together for a common framework.

## Oh, what a tangled web

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cabling, and the quality of technical support is higher than in the U.S. That's because until the past few years, the region was "ignored and abandoned" by both U.S. and Japanese manufacturers, he says, although many multinational hardware manufacturers provide in-country service and support today. Thus, entrepreneurs have learned systems themselves — and provide the service to locals.

"These guys have had to figure it out on their own," Richard says. "As a result, the level of sophistication in tech support often is higher."

Where sophistication lags is within some of the local companies themselves. Few have upgraded their systems to compete on a global level because of past

laws protecting them from outside competition, says Amilcar Marques, an analyst at Gartner Group Inc. in Curitiba, Brazil.

Such laws are outdated today, but local companies still lag behind the global standard by upward of five years, Marques says, and about 80% of companies "use the old method of paper and a lot of memorandums."

Even connect speeds with local companies may be unrealistically slow. Large companies tend to take it upon themselves to help automate priority suppliers.

For some, the attitude is, "This is painful. It takes time and money. So why do it if you don't need it?" Marques says. "This is common, espe-

cially in the government."

As MIS director at Foote Cone & Belding Advertising in Latin America, Jaime Graterol has experienced the highs and lows of the region's IT capabilities.

In the largest of 27 regional offices, such as those in Brazil, Argentina, Mexico, Puerto Rico and Venezuela, the company uses fractional T1 lines.

Smaller offices pay the per-use dial-up fee. Though the cost is high, the options are few to keep the 550 terminals linked regionwide. "It kind of balances out," Graterol says.

He acknowledges that some

countries hum better than others. But from an IT perspective, Latin America has evolved into a sound market, he says.

The learning curve has grown short, and

skilled IT workers have become bountiful — more so than when Graterol joined the agency in 1983.

To newcomers, Graterol offers this advice: Realize the subtle differences among countries, expect delays in getting permits or hooking up telephony lines in some of the larger markets, and make friends among civil servants.

"Many of us, being from the region, know the problems you can have," the native Venezuelan says.

"To set up a shop, you need a lot of permits, and it's going to help you if you have contacts," he says. "What can I tell you? That's the reality." □

*Zbar is a freelance writer in Coral Springs, Fla.*

Realize the differences among countries and expect delays.

# GLOBAL ROLLOUTS:

## A sticky business

BY EDWARD M. ROCHE

A company was asked by its major customer, "How much did we buy from you last year worldwide? Can we get the same terms everywhere and have a single point of contact?"

The CIO was embarrassed that it took more than two and a half weeks just to get consolidated data on global sales to the customer. Why did it take that long? Because the enterprise was organized in a "multidomestic" infrastructure, with functional areas of the business duplicated in each country.

For many companies, rolling out enterprise systems is the answer to building that type of global capability.

Enterprise systems such as those from SAP AG, J. D. Edwards & Co., Baan Co. and Oracle Corp. help today's multinationals deploy complex strategies, leveraging better communications, faster processes, shorter product life cycles and global customer support through an infrastructure that's efficient but also adaptable to local needs.

But rolling out those systems can be problematic. Political control is complicated by torn loyalties among corporate information technology departments and overseas staff. Managers enjoy seemingly cooperative meetings in subsidiaries, but no action is taken once they get back to headquarters.

Ownership structures such as joint ventures give more autonomy to local data processing establishments, inhibiting cooperation in building systems. Even the scarcity of resources

in different countries conspires against global consistency.

Other factors, however, tend to accelerate enterprise rollouts. Positive developments in telecommunications, distributed hardware and operating systems, and collaborative virtual team techniques aid the rollout work.

Nevertheless, we have noticed a disturbing trend. Rolling out enterprise

applications intended to support virtual teams. E-mail systems, Lotus Notes installations, intranets and the like are used to link professionals in a transnational network flexible enough to tackle global strategic issues and sudden business challenges.

Collaborative integration is based on a highly distributed architecture, with no single point of failure and many potential areas of success.

Scale integration takes advantage of the radical efficiencies to be gained in cost per transaction.

It entails dramatically reducing the number of a company's data centers and cutting IT expenses while improving service.

The technologies involved rest upon the rapidly growing capacities of transaction processing systems. Networks provide access to those large data centers from all parts of the globe.

In most cases, the IT team must orient itself toward all three approaches rather than arguing about which is best.

It can do that by defining the strategic goal of the enterprise effort and blending

all three integration methods. Multinationals should focus on creating a global applications superstructure that serves as a cogent development platform on which to enable the functional integration needed to compete in the 21st century. □

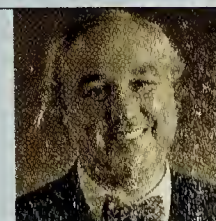
systems is complicated by confusion over the nature of the integration taking place. There are at least three types of integration.

Weberian integration is the classic headquarters-to-subsidiary model and is associated with a traditional view of IT. The hierarchical architecture reigns, with a mainframe at corporate headquarters supported by regional midsize platforms and minicomputers at subsidiaries.

Collaborative integration focuses on



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# The Skills Struggle

It's time to restock the global IT labor pool through training and education

BY TORSTEN BUSSE  
AND MARY BRANDEL

The information technology industry faces a common problem of global proportions: Plenty of work to do and not enough people to do it.

CIOs and IT executives around the world say if the acute skills and labor shortages aren't addressed, national IT sectors will lose their competitive edge, economies will suffer and innovation will slow.

The problem appears to be most threatening in Europe and Asia, where the scarcity of IT workers could stifle hopes for long-term economic growth. In Germany and the U.K., there's a 25% gap between jobs created and jobs filled. That's quite a disparity, considering that the countries together account for half of Europe's total IT production, according to the German Information Technology Association.

Most of Latin America faces a similar threat. The region's burgeoning high-technology market can't enjoy continued growth if skilled workers continue to be lured elsewhere.

Meanwhile, in the U.S., a debate rages as to whether corporations should be allowed to import talent at such a furious rate. Many high-tech companies say they can't fill their ranks without looking outside the U.S.,

while others say there are plenty of domestic workers. Either way, U.S. hiring continues at an aggressive pace: In *Computerworld's* Annual Hiring Survey, half the 270 IT managers who participated say they hoped to grow their staff by more than 10% next year. One-third of the job requisitions opened last year were never filled, the hiring managers report.

As a result, salaries around the world are skyrocketing, turnover is high and innovative projects are being placed on the back burner in favor of more pressing concerns, such as year 2000 issues and the euro conversion. Dataquest in San Jose, Calif., expects top-end programmers to see their salaries rise by about 12% in Europe. According to *Computerworld's* Annual Salary Survey, the average IT salary increase in the U.S. is 9% — more than twice the national average for other professions.

## START-UP BUSINESSES

Other countries, such as Russia, Brazil and the Philippines, face quite a different staffing picture. With an abundance of skilled programmers, those countries are seeing businesses crop up to take advantage of the situation. Last May, the Bulgarian government set up Rila Software Corp., which will offer the services of 7,000 software professionals to Europe and North America.

Along the same lines, the U.S. subsidiary of Lavori

International, a Brazilian job placement and recruiting company, is considering opening an office in the U.S. "We estimate that in Brazil, there are about 5,000 IT job openings for the 12,000 students who graduate every year," says Luis Henrique Kubota, former vice president at Lavori.

And in Russia, a software development company called Arcadia Inc. has extended its business to include a training, exchange and placement program. The idea is to bring in additional software contracts, make better use of St. Petersburg talent, train and place Russian programmers for work abroad and give programmers who want to stay in Russia a crack at some international training.

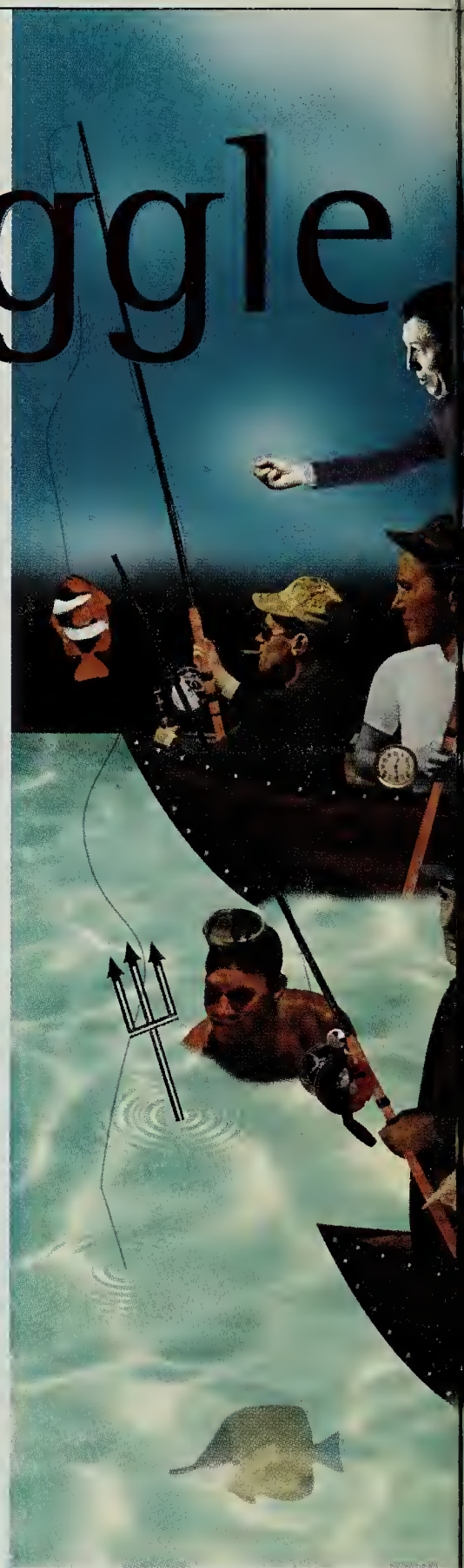
However, some observers fear an eventual brain drain as IT talent departs for foreign lands. Last year, the Philippine Overseas Employment Administration saw the largest departure of IT professionals — 902 individuals — bound for destinations such as the U.S., Saudi Arabia and Singapore.

In fact, cross-border skills-borrowing is becoming common. German software firm SAP AG, for example, is taking the jobs across borders, setting up research and development centers in India and Russia.

But clearly, that isn't the solution. Rather than fishing from the existing (albeit

global) pond, companies need to refresh the labor pool itself. Critics say the global IT industry has failed to invest in employee retraining programs, emphasize the need for basic education or attract students to the fields of math and science at an early age.

In Pakistan, for instance, local colleges and universities are turning out only 600 IT graduates per year. Then there's the added problem of





trying to retain those graduates and dissuade them from going overseas to the U.S. and Canada in search of higher salaries and a better standard of living.

There are exceptions. According to Dataquest, universities in Latin America do an excellent job of satisfying the demand for qualified IT professionals. In the U.S., university enrollment in computer science programs increased by 40% in 1996-97 and by another 39% in the 1997-98 academic year. Companies such as NCR Corp. and Metamor Technologies Inc. are getting involved at the community level to increase educational efforts (see related stories, pages 16 and 17).

In the long term, the message couldn't be more clear: Companies around the world need to focus on training and on working with educators and their governments to raise the level of IT education.

"It's only getting worse," says Simon Lin, president and CEO of Taiwan-based Acer Inc.'s information products group. Taiwan's \$30 billion computer hardware industry has had difficulties filling its technical positions for several years.

"That's why we are trying to push the government to invest more in education and training," Lin says, echoing the sentiments of many of his peers around the world.

"We have to restructure our institutions of higher education from the ground up," agrees Bernd Rohleder, press spokesman for a German IT trade association. Rohleder partly faults the German edu-

cational system for the shortfall in IT staff.

Whether through training or basic education, creativity will be key. For instance, in Holland, Dutch Prime Minister Wim Kok and Secretary of State Jacob Kohnstamm late last year unveiled a plan to get retired programmers back in business.

Meanwhile, Singapore's government has made tackling the country's IT skills shortage a priority. With IT staff requirements rising 11% per year in that country, matching labor skills with market requirements is proving difficult, according to Thomas Yeoh, Singapore's director of Industry and Manpower Development for the government's National Computer Board (NCB).

"To make sure that critical skills are developed to meet the industry's manpower demand, the NCB will continue to expand the Critical IT Resource Program to include training in key and emerging IT skills," Yeoh says.

In the U.S., companies should consider spending 5% to 7% of their IT budget, or \$7,000 to \$10,000 per person, on training and education, according to David Foote, managing partner of Cromwell Foote Partners LLC, an advisory firm in Stamford, Conn.

"There is an issue that the industry expects people to be ready [in terms of relevant skills]," says Vin Sumner,

■ In Europe, 510,000 IT jobs will remain vacant at the end of this year, according to International Data Corp. in Framingham, Mass. By 2002, that number is expected to rise to 1.6 million.

■ There's a shortfall of 20,000 to 25,000 skilled IT workers in Australia. IT jobs will increase by 4.2% in the next three months, according to recruitment specialists Drake International.

■ The IT workforce in Singapore is expected to be 42,000, or about 1.4% of the population, by 2000 — but perhaps that won't prove to be enough.

■ Approximately 10%, or 346,000, of all positions for programmers, systems analysts and computer engineers in the U.S. are vacant, according to the Information Technology Association of America.

■ At least 30% of IT workers in the U.K. now work on a contract basis.

business development director at Sema Group in the U.K.

But "there is not enough fresh blood. Industry needs to be smarter at training people," Sumner says. □

*Busse is San Francisco bureau chief at the IDG News Service. Brandel is editor of the Global Innovators Series. This and related stories were reported by the IDG News Service staff around the world with Nancy Weil and Rebecca Sykes in Boston, Marc Ferranti in New York, Margret Johnston in Washington, Torsten Busse in San Francisco, Jeanette Borzo and Joy Dietrich in Paris, Kristi Essick in London, Elizabeth deBony in Brussels, Mary Lisbeth D'Amico in Munich, Philip Willan in Rome, Rob Guth in Tokyo, Terho Uimonen in Taipei, Taiwan, David Legard in Singapore and Clare Haney in Hong Kong. With contributions from Eric Verweij, news editor at InfoWorld Netherlands, and from Computerworld Pakistan, Computerworld Philippines and Network World Today (Australia). Material from the IDG News Service archive also was used for this report.*

## The West comes up short, despite abundance to the East

BY JEANETTE BORZO,  
KRISTI ESSICK AND  
MARY LISBETH D'AMICO

The European IT labor market — like much else in Europe — is very different from east to west. While Western Europe faces a severe shortage that threatens its ability to compete on a global scale, the market to the east houses an abundance of highly trained IT workers.

"There is a general lack of specialist programmers which is likely to get much more severe over the course of the next year," says Federico Barilli, director general of Italy's

Milan-based National Association of Producers of Technology and Services for Information and Communication.

Consider that in Western Europe, a startling 510,000 information technology jobs will remain vacant at the end of this year, according to a study conducted by International Data Corp. (IDC) and sponsored by Microsoft Corp. That's nothing compared with 2002, when vacancies will total 1.6 million, according to IDC, a sister company to *Computerworld*. And the Business Software Alliance predicts that the packaged software in-

dustry in Western Europe is expected to create more than 92,000 jobs in the next four years.

The U.K., the Nordic countries and the Netherlands show particularly high demand for IT professionals, according to Jonathan Furlonger, a senior research analyst at Gartner Group UK Ltd.

Meanwhile, in Central and Eastern Europe, "there has been an excess of programmers for the last decade," says Robert Farish, IDC's research manager for Russia, in Moscow. The large, highly skilled labor force hails from the former military engineering, project and research organizations, says Michael Novikov, marketing manager for Arcadia Inc. in St. Petersburg, Russia. "And they currently suffer from budget cuts and low salaries," he says.

Even Hungary, which has a higher demand for programmers, has an ample supply of IT workers, says Nadia Griffiths, a research analyst at Dataquest Europe's Central and Eastern European Telecommunications group.

Lacking pan-European statistics, it's best to look at two countries to understand the degree of the shortage.

"The IT sector in Germany creates annually roughly 200,000 new jobs, but there are still 50,000 vacancies for skilled IT workers," says a spokesman for the German Information Technology Association (GITA). The 25% gap is also applicable to the U.K. That's quite a gap, given that Germany and the

U.K. account for 50% of total IT production in the European Union and about half of Western Europe's IT employment, according to GITA.

Adding to Western Europe's labor shortage are year 2000 projects and conversions to the common European Union currency, the euro. Other factors include telecommunication deregulation and booming economies, such as in the U.K.

### TRAINING NEEDED

A lack of university graduates and little corporate in-house training also have aggravated the programmer shortage. Lack of training is the worst offense, according to 33% of the large U.K. companies that said there is an IT shortage in a study conducted by the Computing Services and Software Association in the U.K.

At the university level, "we do not produce enough IT workers each year," says Rakesh Nagpaul, managing director at Compuware U.K., the British-based branch of Compuware Corp., a software and services company. "The problem is very fundamental, and we have to go back to the school level to correct it," he says.

If firms don't increase their training efforts, the number of skilled IT workers will rise only 6% per year through 2002, according to IDC — not enough to fill all the open posts.

If more emphasis isn't placed on training, the entire Western European economy could be at risk, IDC says. □

## DIAMONDS IN THE ROUGH ARE KEY AT COMPUWARE U.K.

By Kristi Essick

There's no such thing as a skills shortage at Compuware U.K., says Rakesh Nagpaul, managing director. Rather than seeking polished IT professionals, Compuware looks for recruits with potential — and then invests in training.

The company admits it pays less than its competitors IBM Global

Services and Electronic Data Systems Inc. Instead, it's the training and flexible work environment that keep turnover low, Nagpaul says.

For instance, one graduate was hired to write technical documentation but then asked to receive Oracle database training.

Others have moved from finance to the networking division. "What people are most worried about is where their job is going," Nagpaul says. "They want variety to keep them interested."



Rakesh Nagpaul of Compuware U.K.

# Despite rampant unemployment, lack of IT skills threatens Asian growth

BY ROB GUTH, CLARE HANEY, DAVID LEGARD AND TERHO UIMONEN

Asia's economic problems may be putting growing numbers of people out of work, but IT-capable workers are still in short supply. In fact, the skills shortage remains one of the greatest bottlenecks to building a broad Asian base of new technology development, according to observers.

The acute shortage of skilled year 2000 staff may further aggravate the situation. Asian businesses will be forced to dedicate even more of their information technology budgets to solve the problem.

"Asian companies are having a particularly difficult time now since the high-tech industry in the West . . . has picked up tremendously," says Andy Chun, managing director of Iona Technologies China Ltd. in Kowloon, Hong Kong. "The current economy in Asia is not helping attract people back from overseas, either."

Some computer vendors are successfully transplanting workers from other countries. But this strategy can backfire. "They stay six months, get qualifications and then disappear at a huge rate for the U.S.," says one Singapore IT executive.

In Taiwan, "there simply are not enough software engineers," says Jason Lin, country manager at market researcher The New Century Group. For historical reasons, most of the island's skilled programmers work in govern-

ment-related organizations, leaving the private sector in limbo.

In Australia, a critical skills shortage is worsening. "There is already a shortfall in Australia of between 20,000 and 25,000 skilled staff," says John Silk, managing director of the Australian subsidiary of Mastech Corp. "If you don't look after your staff financially, be prepared to lose them to those who will."

Another approach is being adopted by the Malaysian government, with its vision to build a Multimedia Super Corridor (MSC) as a seedbed for growing a local IT industry with global significance. The government is wooing IT firms worldwide to set up shop and bring workers to the MSC. But many observers say Malaysia will have difficulty

fueling its ambitions.

"About 25,000 knowledge workers will be required over the next five years by the 124 companies that have received MSC status," says Malaysia Education Minister Najib Tun Razak.

The currency crisis has been less severe in Hong Kong, but the Special Administrative Region there also suffers from a shortage.

The problem is that Hong Kong lacks a strong base of local software companies to attract talent, according to Richard Tseng, director of software engineering start-up Auco Asia Ltd. in Chai Wan, Hong Kong.

"Much of the software is systems integration work, not engineering work," he says. "There are not the development companies here to cre-

ate the necessary skill sets." Tseng decided to recruit computer science and electrical engineering graduates straight out of college and train them in the necessary skills.

Many companies are turning to education as a cure. However, "it normally takes 10 to 15 years to develop the necessary skills needed by the new and emerging IT and multimedia industries," Razak says.

If the Malaysian minister's comments are on the money, Asian countries touting themselves as IT industry launchpads might well find their ambitions thwarted by the lack of skilled local labor.

That is, unless they and their governments act quickly, with significant investments in both education and retraining for IT positions. □

## SONY FINDS CREATIVE SOLUTIONS TO SOFTWARE NEEDS

By Rob Guth

Several years ago, Sony Corp. discovered that its traditional focus on hardware wasn't enough, according to Takao Nakano, a general manager at Career Development International Inc., the Sony subsidiary charged with the company's training function.

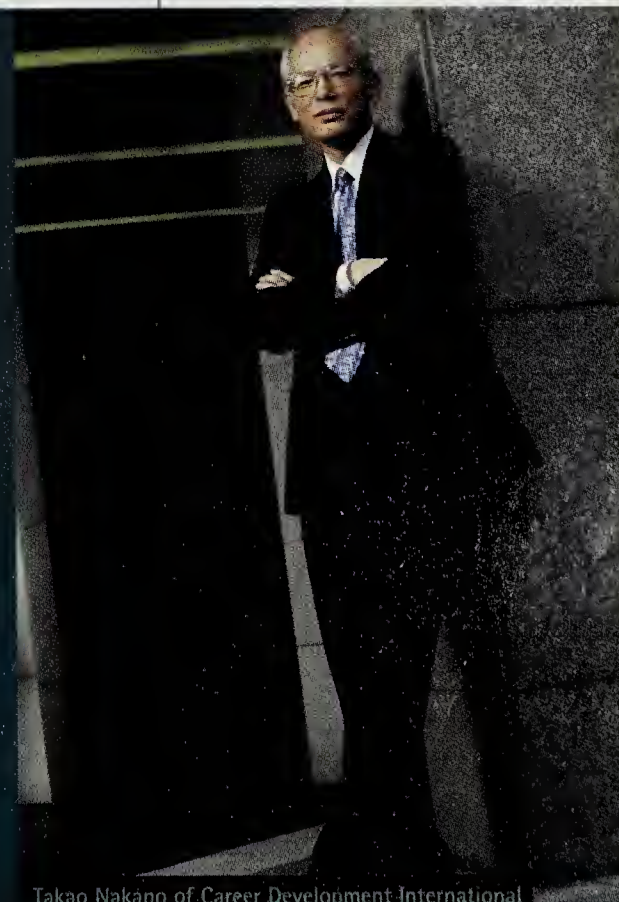
With an expanding but small pool of software skills in Japan and a tight market in the U.S., Sony sought creative answers.

In February, it opened its \$1.5 million Sony India Software Center in Bangalore, which will help develop business applications and software for consumer products.

Back in Japan, the challenge is to instill a software mind-set into older project managers.

Enter Richard Fairley, an academic with 25 years of experience teaching software engineering and software project management. In two years, about 280 employees have attended Fairley's now-expanded courses at Sony.

"It took the scales off their eyes," Nakano says.



Takao Nakano of Career Development International

TOM WAGNER/SABA

# Shortage or no shortage?

## Foreign workers throw the question into turmoil

BY TORSTEN BUSSE

Mention H-1B visas to Linda Kilcrease, a New Jersey-based programmer, and she sees red.

In 1994, Kilcrease and the 250-strong information systems department of insurance firm American International Group Inc. was fired and replaced with foreign workers brought in on H-1B visas by the outsourcing service Syntel Inc. The H-1B visa is a "specialty occupation" visa offered annually by the U.S. to 65,000 foreign workers.

"Before we left, they made us train our replacements at our own desks," says Kilcrease, who now actively lobbies against the H-1B program.

In the U.S., the debate over the information technology labor shortage has become a

very divisive issue. Throughout the year, vendors such as Sun Microsystems Inc., Intel Corp., Microsoft Corp. and their lobbying organizations have battled unions, industry associations and the U.S. government as they sought an expansion of the H-1B program.

Proponents of H-1B visas argue that unless they're allowed to look across borders for engineers and programmers, the IT sector will lose its competitive edge. They would like to see the cap doubled or tied to some economic indicator such as the U.S. unemployment rate.

But critics blast the labor "crisis" as a myth created by a greedy industry that wants to hire cheaper foreign workers. Many programmers, for instance, fail to see the crisis af-

ter running into highly selective hiring practices.

The U.S. government, meanwhile, says the H-1B program is in need of reform. For instance, more than 80% of H-1B holders now earn salaries of less than \$50,000 per year, according to John Fraser, deputy wage and hours administrator at the U.S. Department of Labor. If H-1B visas were really being issued to foreign nationals with unique skills, they would earn a lot more, he says.

A case in point is Syntel, which because of its contract with American International, was slapped with a hefty fine by the Department of Labor for paying its computer programmers from India wages 20% below the legal standard.

Other H-1B critics say the

number of visas is rising 10 times faster than the growth rate in IT jobs. Still others point out the low hiring rates — about 2% of all software applicants — and moderate wage increases, which stood at 7% last year.

But IT vendors maintain their demands, arguing that if they're prevented from hiring additional H-1B workers after the cap is reached — which occurred in May — the U.S. high-tech industry will suffer.

Amid a raging debate, lawmakers responded to industry's calls for action. In mid-September, Congress and the Clinton administration agreed on a compromise bill that raises the number of H-1B visas to 115,000 next year.

In 2001, the number would drop to 107,500; it would return to 65,000 in 2002. The compromise bill would provide college scholarships for low-income students and job training for U.S. workers.

A final vote on the bill was unexpectedly blocked in October by Sen. Tom Harkin (D-Iowa), who said he felt there was no need for it. It was then passed as an amendment to the Omnibus Appropriations bill, which was approved by Congress and signed into law by President Clinton at the end of October.

Meanwhile, organized labor and university officials say the U.S. would be better off investing more in educational programs and initiatives. "We have a skills, not a labor shortage," says Paul Anderson, an official at the Communications Workers of America in Washington. □

## A CIVICS LESSON

By Mary Brandel

Metamor Technologies Inc. certainly takes advantage of the H-1B visa program. But even though one-third of its 450 information technology employees hails from outside the U.S. — primarily on H-1B visas — the fast-growing Chicago-based IT consulting firm is working to grow domestic IT skills.

Metamor has instituted several citywide projects to increase Chicago's — and its own — skills base, according to Brian Farrar, president of the company. With its latest, called Silicon Seed, Metamor will partner with Chicago corporations and community colleges. After finding large corporations with projects that can't be finished because of a lack of qualified staff, it will hire student apprentices and train them in the latest software tools. The students will be assigned real-world projects and closely mentored throughout their two-year apprenticeships by senior IT professionals.

As a lure, corporations get a cut rate, as well as first



Brian Farrar, president of Metamor Inc.

right of refusal to hire the apprentice.

"We're 300,000 people short in the IT space," Farrar says. "It's in both the government's and industry's best interest to close that gap, or we'll all end up using the H-1B process to bring in labor from [other countries]."

## In most regions, labor supply can't meet skyrocketing demand

BY JUAN CARLOS PEREZ

In the past three to five years, Latin America's IT market has seen enormous growth, causing a shortage of IT pros in parts of the region. In Venezuela, for instance, the demand for skilled IT professionals has skyrocketed in the past two and a half years, as more and more companies migrate to open systems environments, says Jorge Mora, IS manager at Seguros Pan-American, a large insurance company in Caracas.

"We tried to train our own employees, but that didn't yield the expected results," Mora says. "We've concluded that you have to go out and find the candidates with the profile you're looking for and pay them what they ask for."

Mora added that in general, recent college graduates who are now joining the workplace don't have the necessary skills.

"The people coming out of the universities don't have the skills we need," agrees Hermann Gumez, president of Cygnus, a large systems integrator in Caracas.

"So we invest a lot — about 20% of our total revenues — in training our personnel," he says.

Rising salaries are adding to the problem, thanks to the many large, foreign-owned companies opening sub-

sidiaries in Venezuela. Pan-American and other local businesses are forced to increase the wages of IT staffers they want to retain, Mora says.

The situation in Argentina is less clear-cut. Some market researchers see the supply of programmers exceeding demand, but multinationals such as NCR Corp. say talent isn't easy to find and are taking steps to improve the skills base in the country (see related story at right).

Meanwhile, Brazil has more skilled people than the domestic IT industry can support, according to Luis Henrique Kubota, former vice president of Lavori International, the U.S. subsidiary of the Brazilian job placement and recruiting company.

"We estimate that in Brazil there are about 5,000 IT job openings for the 12,000 students who graduate every year," Kubota says.

Generally, midlevel Latin American IT workers tend to migrate toward the U.S. market, lured by the higher wages and better opportunities for career advancement, says Luis Anavitarate, senior analyst for Latin America at market research firm Dataquest.

On the other hand, he adds, "Universities and technical institutes in the region are doing an excellent job of satisfying the demand for qualified IT professionals."

### NOT "JUST A JOB"

By Juan Carlos Perez

Like many multinationals with divisions in Latin America, NCR knows it can't sit around waiting for resumes. "All the companies in the high-tech market have a need for qualified people," says Hermes Luigi Cantini, NCR's human resources director for Brazil, Argentina and Chile, countries where the company employs about 500 workers.

So NCR stays in close contact with the top universities in those three countries, including helping to keep curriculums updated. NCR also offers internship programs, although Chilean law forbids students from working. Many of the interns become full-time NCR employees.

NCR also gives employees a chance to gain new skills, Cantini says. For instance, half the employees in Brazil are taking the free on-site English classes offered there. NCR is planning to implement that program in Chile and Argentina as well.

"Workers in Latin America don't just care about getting good money. They value that they can feel proud of the company they work for," Cantini says.



NCR's Hermes Luigi Cantini

RED MORGAN

A good example is the Instituto Tecnológico y de Estudios Superiores de Monterrey (Technological and Higher Learning Institute of Monterrey) in Mexico, he says.

"Although some will emi-

grate, depending on [their country's] internal situation, most will be important assets to their countries, since IT is at the center of the economic development process," Anavitarate says. □

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# WHAT'S THE DIFFERENCE BETWEEN A LITTLE KID WITH A WEB SITE AND A MAJOR CORPORATION WITH ONE? NOTHING. THAT'S THE PROBLEM.

Building a publishing-only Web site is the first step to becoming an e-business. A step that most businesses (and a lot of little kids) have already taken. That's fine as far as it goes – it's a very cost-efficient way to distribute basic information.

But the real payoff (for businesses, at least) comes with steps two and three. Step two is moving to "self-service" Web sites – where customers can do things like check the status of an account or trace a package online.

Step three is moving to transaction-based Web sites – not just buying and selling, but all processes that require a dynamic and interactive flow of information.

IBM has already helped thousands of companies use the Web to make the leap from being a business with a Web site to being an e-business – putting their core processes online to improve service, cut costs or to actually sell things.

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e-business economics are compelling. According to a recent Booz-Allen & Hamilton study, a traditional bank transaction costs \$1.07; the same transaction over the Web costs about 1¢. A traditional airline ticket costs \$8 to process; an e-ticket costs just \$1. Customers love the convenience; management loves the lower costs.

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